

Learner Accommodations and Instructional Modifications in the Mathematics Classroom for Students with Learning Disabilities

The Learner Accommodations and Instructional Modifications Charts presented in this publication are designed to assist teachers to effectively teach mathematics concepts and skills to students who are experiencing difficulty learning mathematics. The charts provide teachers with (1) suggested "short-term" strategies for students with learning disabilities in the classroom; (2) tools to assist in planning instructional delivery and assessment; and (3) suggested interventions that require teachers to think strategically in planning an appropriate environment for learning (e.g., preparing the physical arrangement for students or making resources available for students with specific difficulties). Teachers may be familiar with some of the interventions suggested or they may want to try some new interventions. With continued use of the suggested accommodations and instructional modifications presented on the chart, teachers will have the opportunity to evaluate their effectiveness. They may revisit the interventions on the charts to refine and further develop their skills. Each student is different.

Teachers can use the charts to match a learner accommodation or instructional modification with the specific difficulty experienced in learning mathematics. However, these accommodations and modifications are suggestions, and do not replace use of effective instructional strategies in mathematics for students with learning disabilities.

This chart is divided into several sections. Each section is dedicated to a learning problem that mathematics students with learning disabilities often display in the classroom: *Inattention/Distractibility*, *Organization*, *Following Directions*, *Memory/Recall*, and *Understanding/Comprehension*. These learning problems are not mutually exclusive for a mathematics student. Teachers may typically find students in their classroom with more than one math learning problem. The adaptations and accommodations presented in this chart fall into two categories: environmental or instructional delivery. The reader can focus on adaptations in the classroom that are *environmental*, such as physical arrangement, student appearance or resources. The *instructional delivery* adaptations cover the teacher-oriented tasks related to lesson presentation, lesson content and activities for tests, and assignment and tasks for assessment and evaluation. Teachers must consider the characteristics and needs of each student and how these accommodations and modifications interact with the planned classroom activities.

Inattention/Distractibility

Environment			Instructional Delivery			
Physical Arrangement	Student	Resources	Teacher-Oriented			
			Lesson Presentation	Lesson Content	For Tests and Assignments	Assessment and Evaluation
Keep desks free from distractions like materials, windows, doors, noise, etc.	Teach students SLANT (sit up, lean forward, ask questions, nod your head, track the teacher.	Use a study carrel to block extraneous information and to limit distractions.	Vary presentation of concept: hands-on activity, teach-pair-share, student work at board or at seats.	Have students work each step of a math problem in a different color.	Break assignments into short sections, provide feedback, then assign next section.	Teach self-monitoring techniques: goals for time and completion of task.
Use proximity seating.	Teach student to give a physical sign when concept is not understood: shake head or put hand up.	Assign a peer tutor.	Use highlighters to direct student attention to important information, key words, and directions.	Provide copies of sample problems to prevent student copying in error.	Highlight operational signs.	Check tasks off as they are completed.
Surround student with appropriate role models.		Use colored paper to present problems or activities.	Use physical, visual, or auditory signals to redirect student to stay on task.	Encourage students to vocalize or whisper the content and procedure.	Regulate breaks for tasks with pencil sharpening, bathroom or water break.	Allow student additional time to complete assignments/ tests.
Change student environment periodically.		On paperwork use frequent indentations, double spacing and boxes to provide visual cues.	Talk slowly with voice change or with emphasis on key word or definitions.	Give students a physical cue for important concepts or key information.	Copy problems/tests on only one side.	Check for understanding with "thumbs up or down."
			Use concrete materials for hands-on or visual presentation of math concepts.	Use games to reinforce math concepts.	Circle or box in answers.	

Organization

Environment			Instructional Delivery				
Physical Arrangement	Student	Resources	Teacher-Oriented				
			Lesson Presentation	Lesson Content	Lesson Preparation for Student	Tests and Assignments	Assessment and Evaluation
Have students check in (& check out) unnecessary books and notebooks at the door.	Remove unnecessary coats, hats, scarves, gloves.	Assign peer to assist with organization and deadline dates.	Provide demonstration & modeling, guided practice and frequent review opportunities.	Create and teach routines and procedures.	Check homework daily.	Use assignment books and calendars.	Use checklists and mnemonics to help remember content.
Attach items (pencils, rulers, eraser) with velcro to desk.	Teach students SLANT (sit up, lean forward, ask questions, nod your head, track the teacher)	Color code notebooks and textbook covers.	Have students complete missing words in outline presented.	Provide outline of content planned.	Send copy of homework to parents.	Check for written assignments and tests daily.	Teach goal-setting for tests and assignments.
Provide time EACH week to organize desk and notebooks.		Use graph paper for calculating problems in columns.	Avoid cluttered/crowded worksheets.	Color code main steps, processes & vocabulary.	Send daily/weekly progress reports home.	Provide page numbers where answers to problems can be found.	Teach time management skills for taking tests and assignments.
		Use pencil cases to keep pencils, erasers, and rulers for homework.		Provide advanced organizers for content.	Create backward timeline to estimate time to complete each part of project.	Write answers in boxes for tests and assignments.	Teach prioritizing skills for assignments and tests.
		Use computer to complete assignments.			Teach students notetaking skills.		
					Teach students to highlight key information.		

Following Directions

Environment			Instructional Delivery			
Physical Arrangement	Student	Resources	Teacher-Oriented			
			Lesson Presentation	Lesson Content	Tests and Assignments	Assessment and Evaluation
Provide reminders of routines (recess, lunch, music, etc.) on signs in the classroom.	Make sure there is eye-to-eye contact, and speak slowly and distinctly.	Assign a buddy to clarify directions	Model or demonstrate each step of problem.	Have students verbalize content, directions, and techniques. Detect errors or misunderstandings.	Have students check off or highlight each step of problem as completed.	Use think/pair/share to assess their understanding of directions for assignments and projects.
Provide visual displays in the classroom to help follow directions.	Ask students to give facial clues for understanding directions: nodding or shaking head or hand.	Use flowcharts, webs, pictorials, key word displays to listen and follow directions	Design presentations, including oral ones, so they are smaller & shorter.	Provide example of correct format & completed sample problem.	Provide only one portion of assignment or test at a time.	Highlight operations (+, -, x, /) on tests and assignments.
Provide reminders of procedures/forms due for field trips, concerts, or plays.	Teach students SLANT (sit up, lean forward, ask questions, nod your head, track the teacher).		Provide visual cues & reinforcement of lesson content.	Provide an outline of content presentation.	Give student extra time to respond to oral questions.	
			Use graphs and tables to reinforce concepts.	Use mnemonics aids to signal steps in a process (For Division: Does McDonalds Sell Cheese Burgers-divide, multiply, subtract, check, bring down).		
				Provide a protocol for each lesson: what are the concept(s) of the lesson, show them the conceptual instruction, then summarize what they learned.		

Memory and Recall

Environment			Instructional Delivery			
Physical Arrangement	Student	Resources	Teacher-Oriented			
			Lesson Presentation	Lesson Content	Tests and Assignments	Assessment and Evaluation
Place a schedule of classroom routines and timelines on the bulletin board.	Use body parts to remember number facts. Use hands for multiples of five and ten.	Provide a schedule of classroom routines and timelines for each student's notebooks.	Maximize student's potential by providing a balance of visual and auditory stimuli.	Chunk pieces of information and concepts together (Have students learn facts in sets of three).	Teach students to use self-questioning techniques.	Provide multiple opportunities for practicing assessing concepts in different formats (written, oral, etc.).
Label objects in the classroom with geometric names: quadrilaterals are squares (window panes), rectangles (paper), parallelograms (in artwork), trapezoid (in a picture frame).	Use hands to remember 9's multiplication tables. Spread hands out. Label fingers from 1-10. Hold down the no. 3 finger. Therefore, $9 \times 3 = 27$. (Count fingers to left of 3 as 2 tens and fingers to right as 7 ones.)	Provide number shapes to retrace when learning to write numbers correctly.	Use semantic maps and diagrams to help students make connections between concepts.	Re-teach concepts often, varying the approach each time.		Use songs, rhymes, or rhythms to help remember information for understanding.
		Provide geometric shapes and other manipulatives to visualize names and properties of shapes.	Allow students to trace over geometric shapes and other visual patterns during visually presented lessons.	Point out then repeat the concepts and main ideas at the beginning, in the middle, and at the end of a lesson.		Use mnemonics to practice representing steps in Order of Operations- (Please Excuse My Dear Aunt Sally -- Simplify in order: parenthesis, exponents, X or /, then + or -).
						Use flashcards for individual or group review.
						Play memory games to prepare students for evaluations.

Problems with Understanding and Comprehension

Environment			Instructional Delivery			
Physical Arrangement	Student	Resources	Teacher-Oriented			
			Lesson Presentation	Lesson Content	Tests and Assignments	Assessment and Evaluation
Arrange students in groups for cooperative learning groups	Use SLANT to track understanding (sit up, lean forward, ask questions, nod head, follow the teacher).	Provide learning aids such as calculators and computers to help students focus on conceptual understanding.	Provide visual cues (objects, drawings) to help students who may have difficulty visualizing shapes, dimensions, and sizes	Show the purpose of a lesson, then provide an example of a correctly solved problem at the beginning of a lesson	Provide opportunities for problem-solving, reasoning, and real-world applications to help with transfer of information.	Use estimation in problem solving and to have students evaluate if a solution is reasonable prior to actual computation.
Arrange manipulatives in easily accessible labeled containers for student distribution and use	Teach student to give physical signs of understanding concepts with hands (thumbs up or down) or head nodding.	Have manipulatives available for number and geometric concepts.	Use cooperative learning techniques: "jigsaw" and "think-pair-share."	Teach in small chunks so students get lots of practice with one step at a time.	Have a student verbally or visually explain how to solve a math problem.	Observe students talking aloud to solve problems and identify the correct steps to solving problems.
		Use audiotape versions of textbooks.	Model and teach metacognitive strategies (Model and verbalize procedure, guide students through verbalization of problem computation, monitor student verbalizations as they complete procedure, provide periodic reviews).	Teach the meaning of key vocabulary words.		Observe students practicing different formats of assessments.
Arrange computers and calculators easily accessible for student use.		Use the structure of the textbook to understand how the concepts are organized and how the format on each page and section indicates tasks.		Introduce only one concept at a time and teach to mastery.		Provide students with opportunity to practice a strategy to solve word problems, such as the Mnemonic: STAR (Search, Translate, Answer, Review).
		Provide chart or graph paper for visualizing and problem-solving.	Use manipulatives to demonstrate concepts.	Teach number facts in fact families.		
		Assign buddies to "think-pair-share."				